

## Geotailによる大振幅低周波電場波動の総括(1)

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### Large amplitude low-frequency electric field observations by Geotail (1)

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Large amplitude electric field has been observed by the Geotail spacecraft in various regions of space plasma around the Earth. This paper summarizes those event and origins based on electric fields, magnetic fields, plasma waves, and plasma particles. The main target is a) origin & role of large amplitude electric field and b) search for induced electric field. The data set is electric field observed by Geotail/EFD-P, wire antenna with sphere probe (100m tip-to-tip). It is calibrated by " $V \times B$ " with "Spacecraft potential". Reliability is  $\sim 0.3\text{mV/m}$  in  $E_x$  (if the angle between magnetic field and X-axis:  $> 45\text{deg}$ ) and  $\sim 0.3\text{mV/m}$  in  $E_y$  (if the angle between magnetic field and Y-axis:  $> 45\text{deg}$ ). In the near tail regions, large amplitude electric fields are found in the plasma sheet and its boundary region at radial distance  $\sim 15 R_e$ , and are associated with the largest changes in the magnetic field and the intense substorm activities. In DC electric field (electric field in DC-4Hz), dawn-to-dusk electric field is clearly shown in the inner magnetosphere. It has only weak positive correlation with geomagnetic disturbance. This is generally agreed with Hori et al. (2005) and Miyashita et al. (1999). By the way, waves and spikes in  $4\sim 32\text{Hz}$ , it is not uniform, unlike the Dawn-to-Dusk electric field. It is concentrated near GSE-Y  $\sim 0$ , and enhanced especially in the region near the Earth with large geomagnetic disturbance. Event studies show that the major sources are at the PSBL. The nature and the mechanism of those intense & rapidly changed electric field will be discussed.